Social Capital of Students in the Light of Social Networks:
Structure and Key Actors Analysis

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Abstract. The social capital of students is an important resource developed at university, along with professional competencies. We analyze friendship and study help networks among first-year students, examine network structures, and calculate network parameters and correlations between them. Student relations in different programmes are identical in nature, which is proven by similar structures of both friendship and help networks. We identify statistically significant correlations between network parameters of outcoming and incoming interpersonal ties, as well as between academic performance and peer network status. Friendship ties are more numerous, stable and reciprocal than study help ones. Each network has students who hold the key positions in terms of betweenness and popularity. Academic performance is a significant factor affecting student status in study help networks. We suggest that students holding the key positions in both betweenness and popularity enjoy the best opportunities for using their social capital.
Keywords: higher education, social capital, social networks, study help networks, friendship networks, popularity, network centrality, betweenness.

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When studying in university, students not only obtain new knowledge but also develop social ties, which actually represent their social capital. The latter is a multidimensional phenomenon difficult to measure, so no universal definition exists for it as yet. In the broadest strokes, social capital can be regarded as a resource that actors use to pursue their interests [Gradoselskaya, 2004]. In a classic definition by Pierre Bourdieu, social capital is described as a resource linked to membership in a social group or social network, where the volume of such capital possessed by a given agent depends on the size of the network of connections they can effectively mobilize [Bourdieu, 1986].

Social capital facilitates production [Coleman, 1988], helps in finding a job [Granovetter, 1973[1]; Yakubovich, 2005] and promotes innovation [Burt, 2009]. The role of social capital in education is manifest in peer effects: academic performance of a student depends not only on their competencies, personal characteristics and traditional learning environment factors but also on the characteristics and achievements of their peers [Epple, Romano, 2011; Poldin, Yudkevich, 2011].

James S. Coleman emphasizes that social capital is not lodged in actors themselves, it rather inheres in the structure of relations between people [Coleman, 1988]. Therefore, social capital should be studied in conjunction with the concept of social network. The same opinion is shared by Radaev [2002], who defines social capital as a network of social ties of different levels. Thus, social capital can be measured using the characteristics of the network itself and the local characteristics of its actors.

In this article, we analyze the structure of social networks among first-year students of a national university in Nizhny Novgorod and identify the most powerful points in the networks. The data was obtained through a survey of first-year students majoring in Business Informatics, Management, Economics and Law. The questionnaire included questions about the socioeconomic status of respondents, their place of residence, part-time jobs, friendship relations with peers and learning-related interactions with them. Using the survey results, we construct oriented graphs describing friendship and peer support networks, and analyze their main characteristics and the correlations between them.

Applying the social network approach to peer interactions among students is logically relevant [Biancani, McFarland, 2013; Krekhovets, Poldin, 2013]. The approach had been used to describe processes both in schools [Ivaniushina, Alexandrov, 2012; 2013] and universities in Russia [Valeeva, Poldin, Yudkevich, 2013; Pronin, Veretennik, Semenov, 2014]. An overview of social network research in higher education allowed Susan Biancani and Daniel A. McFarland [2013] to reveal the lack of "descriptive works on social networks of students", which is especially true for Russian studies. This work is an applied study designed to fill the gap by providing a detailed description of the structure of social networks among university students.

1. Social networks of students

1.1. Help networks

While studying, students may work on team projects or help one another in solving training tasks, thus building a social support network. The questionnaire asked students to name the peers that they asked for help most often. The nominated students were classified as helpers. The resulting help network involved over 80% of first-year students.

[1] Translation available [Granovetter, 2009].

Table 1. **Attributes of help networks among first-year students**

	Economics	Management	Business Informatics	Law
Number of students	96	87	81	44
Number of ties	351	251	202	81
Network diameter	10	9	9	8
Average geodesic distance between reachable nodes	4.43	3.78	4.13	3.47
Average number of helpers	3.7	2.9	2.5	1.8
Density (%)	3.9	3.6	3.1	4.3
Proportion of reciprocalties (%)	30.8	29.5	17.8	22.2

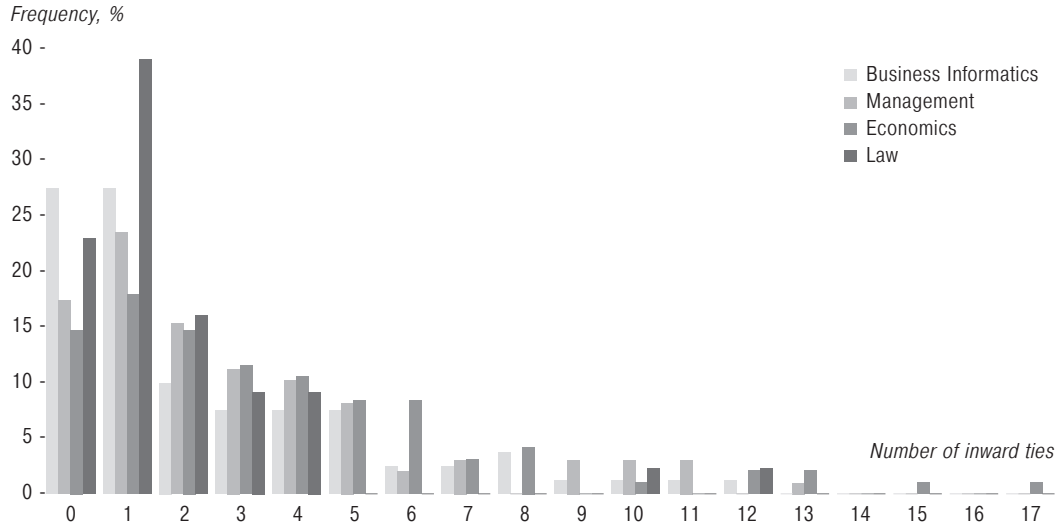
Table 1 presents the standard network characteristics of peer help networks.

We describe the network structure using the density index, which is defined as a ratio of ties in the given network to the number of all possible connections within it [Wasserman, Faust, 1994]. The networks that we analyze have a rather low density, from 3.1% to 4.3%, which is quite typical for social networks as people have limited social circles and the number of real interactions is normally much lower than it potentially could be.

We revealed that network diameter and average geodesic distance between reachable actors are more or less the same across the departments. The distance is measured by the number of (non-oriented) relations in the shortest possible walk from one actor to another. The diameter of a network is the largest geodesic distance in the network. These characteristics show how close the network nodes are from one another, allowing us to assess how fast information is distributed within the network. On average, two students from one department need a chain of four ties to interact on the learning issues, the diameter of the network being from 8 to 10. These parameters depend on the size of the network and the number of nodes and ties, so the highest indices are found in the Economics Department (as the largest one) and the lowest in the Law Department (half the size of the other departments).

The average number of helpers is determined based on the average degree of a network. The degree of a node is the number of connections it has to other nodes in the network, i.e. the number of all nodes connected to the given one [Wasserman, Faust, 1994]. As soon as we use directed ties to describe networks in this study, we can calculate the in-degree and the out-degree for each actor, i.e. the number of peers who named the student as a helper and that of peers nominated as helpers by the student. The number of inward ties shows

Figure 1. **In-degree distribution in support networks of students**



the popularity of the student in the network, while the number of outward ties shows the student's activity.

According to the results we obtained, the lowest number of inward ties is found among law students, where each actor has on average two peer helpers, as compared to 2.9 and 2.5 in the Management and Business Informatics Departments, respectively, and 4 in the Economics Department.

The degree distribution (histogram) displays how often different degrees can be found in the network. Figure 1 shows the in-degree distribution, which reflects popularity in the network.

As we can see from the figure above, the most frequent situation is where a student is asked for help by one peer. From 10% to 22% of students in different departments do not help their peers with their studies, as no respondent nominated them as helpers. Students who are asked for help more often than others hold the most important position in a help network. The forms of in-degree distribution are pretty much the same across the departments.

Table 1 also displays the proportion of reciprocal ties in support networks. This parameter shows how many pairs of students nominated each other as peer helpers. The average proportion of such pairs in the sample is 25%. This result is quite logical: if a low performer asks a high performer for help, there will hardly be any reverse tie between them. Reciprocal ties are more likely to form between students with similar levels of academic performance.

Help networks among students of different departments are very similar in their structure. Insignificant variations in network parameters are mainly explained by the different sizes of the departments.

Table 2. **Attributes of friendship networks among first-year students**

Attribute	Economics	Management	Business Informatics	Law
Number of students	105	97	93	60
Number of ties	537	486	452	244
Network diameter	8	7	10	6
Average geodesic distance between reachable nodes	3.8	3.2	4.3	2.7
Average number of friends	5.1	5	4.9	4.1
Density (%)	4.9	5.2	5.3	6.9
Proportion of reciprocalties (%)	67.4	63	63.3	51.6

1.2. Friendship networks

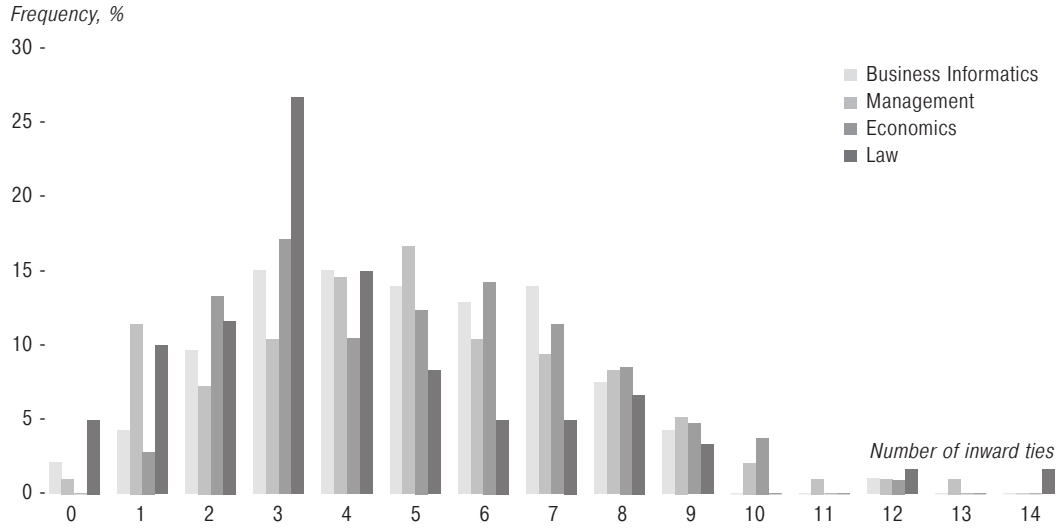
Ronald S. Burt defines social capital as friends, colleagues, and general contacts through which the actor receives opportunities to use his or her financial and human capital [Burt 2009]. As far as friendship ties are informal, they are easier to form and to maintain: friends share not only the university but also their interests. Friendship ties most often serve the basis for numerous studies devoted to the social networks of students.

To construct friendship networks, we asked students to specify the peers with whom they communicated the most, regarding the nominated peers as friends. The survey results allowed us to build oriented friendship networks for the four departments, which included over 95% of enrolled students. Table 2 presents the quantitative characteristics of the friendship network structure.

The density of friendship networks varies from 4.9% to 6.9%, which is almost twice as high as in help networks. In other words, students create many more social ties not related directly to studies, being more likely to engage in informal interactions.

Students are interrelated closer in friendship networks than in help networks, which is proved by lower social remoteness indices: network diameter and geodesic distance. Within the friendship networks, a law student needs the least number of ties to interact with any other law student. The longest chain, judging by the network diameter, is typical of the Business Informatics Department: this is partially explained by the fact that different student groups in this department often have classes in different locations far away from one another, so students have fewer communication opportunities. The longest chains in management and economics comprise 7 and 8 ties, respectively. Meanwhile, only 3.5 ties are required to make friendship interactions in all departments. In addition, the geodesic distance is 15–20% shorter in the friendship networks than in the help networks for all departments except Business Informatics where this parame-

Figure 2. **In-degree distribution in the friendship networks**



ter is the highest of all, which also has to do with the specific organizational aspects.

We also calculated the proportion of reciprocal ties within the friendship networks. It varies from 51.6% to 67.4%, averaging 61.4%, i. e. over 60% of pairs of students identify each other as friends. The proportion of reciprocal ties is much higher in friendship networks than in help networks. One of the reasons for this structural difference lies in the mechanism of formation of social ties in different types of networks. Help ties mostly develop between students with different levels of academic performance; they are one-way, directed from low performer to high performer. Reciprocal ties in help networks are most likely to emerge between students with similar levels of attainment. Contrastingly, friendship ties are structured by the effects of homophily and geographic propinquity [McPherson, Smith-Lovin, Cook, 2001], which make the ties reciprocal in most cases due to their nature.

On average, every student in the four departments has four or five friends among their peers. Unlike in help networks, friendship networks involve a great number of social ties among the actors.

The degree of an actor is an essential parameter showing the actor's status in the friendship network. The more friends a student has, i. e. the higher the in-degree, the more popularity and power he or she enjoys in their social network. Figure 2 displays in-degree distribution in the friendship networks.

As we can see from the histogram above, the in-degree distribution patterns are virtually the same in all departments. Most students have from three to seven friends among their peers. Some students were not nominated as friends by anyone. Yet, their proportion is only

about 2%, which is much lower than in the help networks where over 15% of students have no inward ties at all. Students listed as friends by many peers are the key actors of the friendship networks. The structure of in-degree distribution is different in friendship and support networks. We can suggest that in a help network, students prefer calling on one or two responsive high performers for help, while the network of friendship ties is much more expanded.

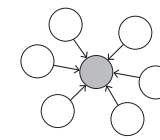
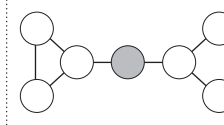
All in all, there are no considerable structural differences among the friendship networks in different departments. The minor discrepancies in specific parameters can be explained by the difference in size. Every student has on average four or five friends among their peers; there are also students who build no peer contacts as well as those who are particularly popular. The friendship networks feature a higher density and a close social distance between the actors, over 50% of the friendship ties being reciprocal.

2. Student popularity in help and friendship networks

Analysis of an actor's position means a lot in terms of describing the structure of a social network. The location of "central" actors is a major objective in network assessment [Freeman, 1979]. Centrality is one of the most effective actor's positioning tools [Abraham, Hassanien, Snášel, 2009; Friedkin, 1991], showing the position of a node relative to all other nodes in the network. Several centrality measures have been studied by researchers; we will only use the two classic indicators of degree centrality and betweenness centrality. Table 3 describes these indicators and provides relevant calculation methods.

Degree centrality shows the actor's position in the network based on the number of ties. When graphs are directed, two measures of degree centrality are normally analyzed: in-degree centrality and out-de-

Table 3. **Indicators of centrality in social networks**

Indicator	Calculation formula	Graphic interpretation
Degree centrality	$C_d(i; G) = \frac{indeg_1(G)}{n-1}$, where $indeg_1$ is the number of in-ties	
Betweenness centrality	$C_b(v) = \sum_{s \neq t \neq v \in V} \frac{\sigma(s,t \mid v)}{\sigma(s,t)}$, where $\sigma(s,t)$ is the number of shortest paths between vertices s and t, $\sigma(s,t \mid v)$ is the number of shortest paths between vertices s and t that pass through node v	

gree centrality. The former is calculated based on the number of in-ties, while the latter considers the number of out-ties.

Degree centrality is easy to calculate and may be very useful in a descriptive analysis of social networks, allowing one to identify the key actors or the most important social groups within the network. People or groups with the highest degree centrality have a significant influence and more access to information from other actors than those with fewer ties and thus a lower degree centrality.

When measuring betweenness centrality, we analyze an actor's position based on the number of shortest paths between vertices that pass through that actor. Therefore, betweenness centrality describes the actor's position between other actors, i. e. his or her role as a bridge. The node that lies on the highest number of shortest paths will have the highest betweenness centrality. Such individuals act as intermediaries between other actors, forming bridges between different social groups in the network. Their role is crucial for creating and maintaining social contacts and sharing information.

There are students in friendship and help networks who are listed as friends and helpers more often than others. They have the highest in-degree centrality, being the most popular actors within their social networks. To identify the most important intermediaries in the analyzed networks, we measured betweenness centrality for all of the respondents. Figures 3 and 4 display the distribution of betweenness centrality in the friendship and help networks of students. The histograms demonstrate that the peak of distribution falls on the students whose betweenness position is rather weak. The most prominent actors, who account for 5–10% of students in all departments, have a much higher betweenness centrality, which is typical of both help and friendship networks.

Thus, the analysis of in-degree distribution in friendship and help networks showed that there are leaders in both types of networks in every department. Based on the distribution of in-degree centrality, we can deduce that every department has a few students who play pivotal roles in student interactions within the network.

3. Regression analysis of correlations among network characteristics

In this chapter, we analyze statistical relationships between parameters describing the actor's position in the network as well as between these parameters and some individual characteristics, such as academic performance, gender, level of income, living in a dorm, and combining work and study. Academic performance is measured using the mean score in the first term of the first year of studies, which we take from formal student ratings. We have to standardize the mean score by departments to avoid distortions due to different grading systems. To do this, we subtract the mean department score from the mean student score and divide the difference by the standard deviation; as a result, we get a value with a zero mean and unit variance.

Figure 3. **Distribution of betweenness centrality in friendship networks**

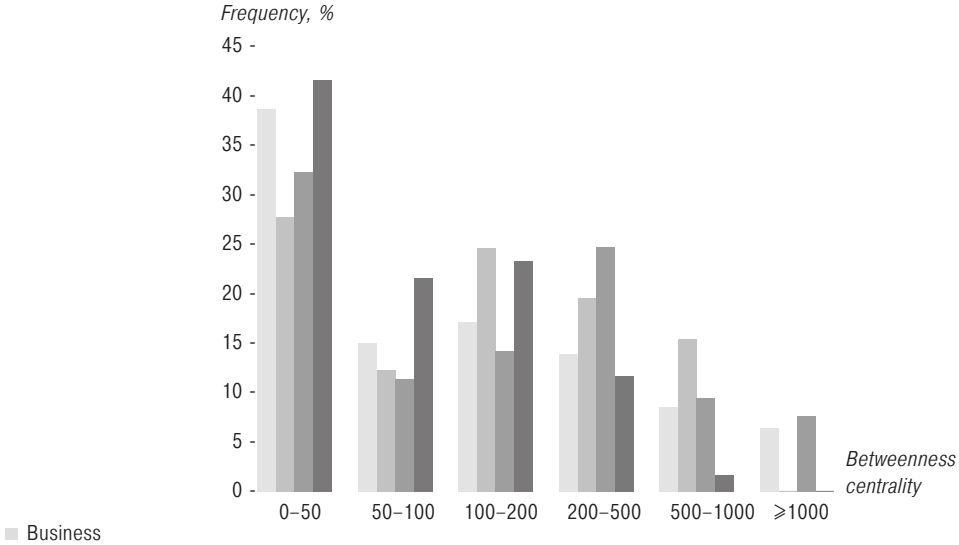
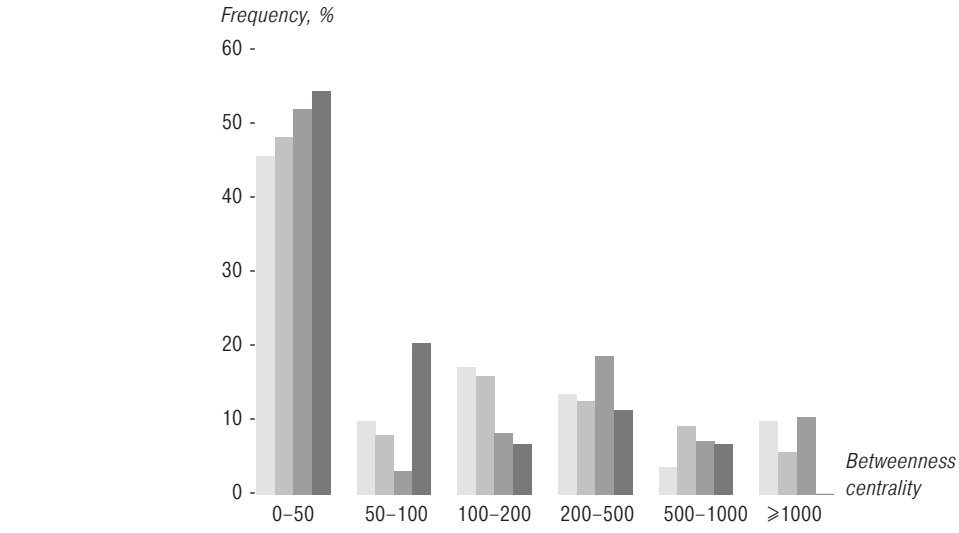


Figure 4. **Distribution of betweenness centrality in support networks**



The "level of income" variable represents an indicator which takes on a value of 1 if student classifies his or her financial standing into one of the four categories offered[2].

[2] The categories were determined based on students' answers to the question: "Please describe the financial standing of your family". The following

Table 5. **Descriptive statistics of variables**

Variable	Number of observations	Mean value	Standard deviation	Minimum value	Maximum value
Average score (standardized value)	299	0.014	0.984	–2.790	2.481
Gender (male = 1)	303	0.330	0.471	0	1
Living in a dorm (yes = 1)	301	0.150	0.357	0	1
Financial standing = 1	12				
Financial standing = 2	40				
Financial standing = 3	174				
Financial standing = 4	32				
Combining work and study (yes = 1)	303	0,201	0,402	0	1
In-degree centrality (friends)	302	0.202	0.402	0	1
Out-degree centrality (friends)	303	0.056	0.031	0	0.237
Betweenness centrality (friends)	303	0.062	0.024	0.010	0.169
In-degree centrality (helpers)	303	0.031	0.048	0	0.394
Out-degree centrality (helpers)	279	0.030	0.034	0	0.203
Betweenness centrality (helpers)	279	0.033	0.023	0	0.136

Table 5 presents the descriptive statistics of the regression variables. We interpret the regression estimators below as correlational relationships, not as cause-effect relationships where changes in regressors entail changes in the regressand.

Table 6 shows the estimators of regressions where in-degree centrality in friendship and help networks is the regressand. Columns 1 and 3 provide regression estimators based on network characteristics only. Columns 2 and 4 also take additional factors into account. As we can see from columns 1 and 2, student popularity in the friendship network correlates positively with activity in the same network and popularity in the help network. Help network popularity also correlates positively with friendship network popularity but shows weak and negative correlations with help network activity. Unlike in the friendship network, student popularity in the help network depends largely on academic performance: naturally, high performers are asked for help more of-

choice of answers was offered: 1—We have enough money for daily expenses, but buying clothes is rather difficult; 2—We have enough money for food and clothes, but buying a TV, a fridge, etc. is rather difficult without taking a loan; 3—We are quite well-off but would have to save a lot or borrow money to buy a car or to go on an expensive vacation; 4—We are affluent, we can afford to buy an expensive car or to go on an expensive vacation.

Table 6. **Regression estimators of correlational relationships for in-ties**

	(1)	(2)	(3)	(4)
	In-degree centrality (friends)	In-degree centrality (friends)	In-degree centrality (helpers)	In-degree centrality (helpers)
Out-degree centrality (friends)	0.508*** (0.086)	0.530*** (0.103)	−0.159* (0.091)	−0.121 (0.076)
In-degree centrality (helpers)	0.294*** (0.053)	0.261*** (0.076)		
Out-degree centrality (helpers)	0.081 (0.115)	0.085 (0.126)	−0.119 (0.086)	−0.032 (0.079)
In-degree centrality (friends)			0.449*** (0.110)	0.252*** (0.095)
Average score (standardized value)		0.002 (0.002)		0.020*** (0.002)
Gender (male = 1)		0.005 (0.004)		0.002 (0.003)
Living in a dorm		0.001 (0.004)		0.006 (0.005)
Financial standing (1)		−0.011 (0.010)		−0.003 (0.008)
Financial standing (2)		−0.002 (0.007)		−0.014** (0.007)
Financial standing (3)		−0.003 (0.006)		−0.005 (0.006)
Financial standing (4)		−0.003 (0.006)		−0.005 (0.008)
Combining work and study		0.002 (0.004)		−0.001 (0.003)
Constant	0.013** (0.006)	0.013* (0.008)	0.019** (0.008)	0.026*** (0.007)
Number of observations	279	263	279	263
R^2	0.294	0.273	0.137	0.425

The values in brackets represent standard errors; *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

ten. The significant role of non-network parameters in the help network can be observed in column 4, where the coefficient of determination (R2) grows thrice as high as in column 3.

Table 7 describes similar relationships but with out-degree centrality as the regressand. Friendship network activity correlates positively with help network activity and friendship network popularity. Help network activity correlates positively with friendship network activity, but the student's popularity has little significance here. Students who live in dorms appear to be less active in the support network. Per-

Table 7. **Regression estimators of correlational relationships for out-ties**

	(1)	(2)	(3)	(4)
	In-degree centrality (friends)	In-degree centrality (friends)	In-degree centrality (helpers)	In-degree centrality (helpers)
Out-degree centrality (friends)	0.347*** (0.054)	0.323*** (0.051)	0.062 (0.083)	0.061 (0.085)
In-degree centrality (helpers)	–0.071* (0.040)	–0.077 (0.048)	–0.060 (0.042)	–0.024 (0.058)
Out-degree centrality (helpers)	0.184*** (0.057)	0.162*** (0.057)		
In-degree centrality (friends)			0.206*** (0.060)	0.191*** (0.067)
Average score (standardized value)		–0.001 (0.002)		–0.002 (0.002)
Gender (male = 1)		–0.003 (0.003)		–0.004 (0.003)
Living in a dorm		0.001 (0.003)		–0.012*** (0.003)
Financial standing (1)		0.019* (0.010)		0.001 (0.011)
Financial standing (2)		–0.002 (0.006)		0.007 (0.006)
Financial standing (3)		0.004 (0.005)		0.007 (0.005)
Financial standing (4)		–0.002 (0.005)		0.004 (0.007)
Combining work and study		–0.001 (0.004)		–0.003 (0.004)
Constant	0.039*** (0.004)	0.039*** (0.006)	0.019*** (0.004)	0.017** (0.007)
Number of observations	279	263	279	263
R^2	0.229	0.247	0.069	0.116

The values in brackets represent standard errors; *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

haps, students in dorms are likely to study together and rather ask their neighbors for help.

Table 8 displays the regression estimators of correlational relationships for betweenness ties. Betweenness centrality in both friendship and help networks correlates positively with popularity and activity in the respective network. In the help network, the regressors explain a much larger amount of variation in the regressand: 31.6% as compared to 7.9% in the friendship network for a “long” regression and 26.9% as compared to 4.2% in the friendship network for a “short” regression.

Table 8. **Regression estimators of correlational relationships for betweenness ties**

	(1)	(2)	(3)	(4)
	In-degree centrality (friends)	In-degree centrality (friends)	In-degree centrality (helpers)	In-degree centrality (helpers)
In-degree centrality (friends)	0.205*** (0.070)	0.178** (0.079)		
Out-degree centrality (friends)	0.224*** (0.084)	0.283*** (0.093)		
In-degree centrality (helpers)			0.678*** (0.118)	0.717*** (0.138)
Out-degree centrality (helpers)			0.688*** (0.168)	0.778*** (0.187)
Average score (standardized value)		0.002 (0.003)		0.001 (0.004)
Gender (male = 1)		0.014* (0.008)		0.001 (0.007)
Living in a dorm		0.007 (0.006)		0.008 (0.008)
Financial standing (1)		−0.001 (0.007)		−0.011 (0.015)
Financial standing (2)		−0.002 (0.005)		−0.029** (0.015)
Financial standing (3)		0.010 (0.006)		−0.015 (0.015)
Financial standing (4)		0.015* (0.009)		−0.016 (0.015)
Combining work and study		0.006 (0.008)		0.000 (0.007)
Constant	0.006 (0.006)	−0.010 (0.007)	−0.014*** (0.005)	−0.004 (0.013)
Number of observations	303	284	282	263
R^2	0.042	0.079	0.269	0.316

The values in brackets represent standard errors; *$p<0.1$, **$p<0.05$, ***$p<0.01$

The average score is the regressand in the regression estimators presented in Table 9. The regressors include the actor's friendship network parameters in column 1, the actor's support network parameters in column 2, and the network parameters of both networks in column 3. The USE (Unified State Exam) admission score is included in the explanatory variables in all specifications, being a standardized value. As can be seen in columns 1 and 2, academic performance and popularity in the network correlate positively. However, when the parameters of both networks come into play as factors (column 3), only popularity in the support network remains signifi-

Table 9. **Regression estimators of correlational relationships for academic performance**

	(1)	(2)	(3)
	Average score	Average score	Average score
In-degree centrality (friends)	6.207*** (1.665)		1.285 (1.719)
Out-degree centrality (friends)	–3.105 (2.679)		–1.000 (2.335)
Betweenness centrality (friends)	0.284 (1.114)		–0.198 (0.822)
In-degree centrality (helpers)		14.597*** (1.683)	14.231*** (1.738)
Out-degree centrality (helpers)		–2.204 (2.042)	–2.240 (2.060)
Betweenness centrality (helpers)		–0.027 (1.034)	–0.011 (1.067)
USE admission score (standardized value)	0.436*** (0.068)	0.288*** (0.062)	0.287*** (0.063)
Gender (male = 1)	–0.366*** (0.111)	–0.215** (0.097)	–0.217** (0.100)
Living in a dorm	0.004 (0.113)	–0.145 (0.100)	–0.145 (0.100)
Financial standing (1)	–0.038 (0.266)	0.112 (0.266)	0.134 (0.263)
Financial standing (2)	0.132 (0.207)	0.366* (0.196)	0.367* (0.195)
Financial standing (3)	0.231 (0.163)	0.311* (0.158)	0.319** (0.158)
Financial standing (4)	–0.081 (0.217)	0.074 (0.200)	0.081 (0.200)
Combining work and study	–0.395*** (0.130)	–0.304*** (0.117)	–0.305*** (0.118)
Constant	–0.096 (0.231)	–0.378** (0.165)	–0.376* (0.209)
Number of observations	282	261	261
R^2	0.329	0.489	0.490

The values in brackets represent standard errors; *$p<0.1$, **$p<0.05$, ***$p<0.01$

cant, i. e. friendship network popularity in column 1 is due to the fact that some of the friends are helpers, too. The correlation between popularity as a helper and academic performance is easy to explain. Interestingly, male students have a considerably lower average score than that which is implied by other factors including the USE admission score.

As follows from the above, there are statistically significant correlational relationships between network characteristics of in-ties and out-ties as well as between academic performance and the actor's position in the social network of peers.

4. Conclusion

This paper provides an analysis of the social networks that students form while studying at university. We study learning-related interactions and friendship relationships among students. Friendship networks have a much higher density, which means there are more interactions among students than in help networks. Friendship networks also feature a higher level of reciprocity. There are few reciprocal ties in the help networks, where helpers are normally better-performing peers. Therefore, we can suggest that friendship networks are more important than help ones in terms of social capital accumulation.

Student interactions in different departments are identical in nature, which is proved by structural similarities between friendship and support networks. The insignificant variations in network parameters are explained by the different sizes of the departments, not by specific characteristics of the learning process.

Both types of networks have actors who play a pivotal role. Popular students have a high in-degree, while active students have a high out-degree.

Student popularity in a friendship network correlates positively with activity in the help network. The most popular actors in help networks are also popular in friendship networks. Help network popularity correlates positively with academic performance, which is quite natural, as high-performers are the ones to help their peers with studies.

There is also a positive correlation between activity in friendship networks and in help networks. The more friends a student lists, the more helpers he or she has, and vice versa. Students who are popular in friendship networks are also the most active, while there is no such correlation in help networks. Living in a dorm decreases help network activity. Perhaps students in dorms solve learning-related issues together and ask other peers for help less often.

Apart from popularity and activity, we also measured the indicators describing the betweenness position in a network. Intermediaries act like bridges connecting all other actors with one another. We revealed positive correlations between intermediary status and student activity in both friendship and help networks. Students with multiple social contacts become prominent intermediaries in the network, and conversely: if multiple paths pass through an actor, he or she becomes popular and begins to create new contacts. We can suggest that students who hold the key positions in a network in terms of both betweenness and popularity enjoy the best opportunities for using their social capital, as their status allows them to involve their social

ties in university to maximum effect. Meanwhile, the key actor position in help networks correlates with academic performance.

Understanding the mechanism of social tie formation and the positions of specific students in social networks is practically important to maintain social and academic interactions among students throughout the period of study. University management and faculties can use this information when allocating students to groups, dorms or team projects. Obviously, apart from the relatively easily observable factors like academic performance, gender or place of residence, a student's position in a network is also affected by other individual characteristics, the role of which is yet to be analyzed.

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